

Marine Biology Lab: Sea Star Dissection



Background: Echinoderms are radially symmetrical animals that only live in the sea. *Echinoderm* means "spiny skin" in Greek. There are over 6,000 species and they usually have five appendages (arms or rays). As larvae, echinoderms are bilaterally symmetrical but, become radially symmetrical as they mature. Sea stars (class *Asteroides*) are sometimes called starfish, though they are not real fish. The sea star's skin looks spiny if you examine it, with different types of growths on the surface. Some bumps, called dermal branchiae, are used to absorb oxygen. Pedicellaria are pincher-like organs used to clean the surface of the skin of parasites. Under the skin the skeleton is made of calcium plates called ossicles. Each sea star has hundreds of tiny feet on the bottom of each ray. These are tube feet, or podia. These tiny feet are filled with sea water. The vascular system of the sea star is also filled with sea water. By moving water from the vascular system into the tiny feet, the sea star can make a foot move by expanding it. This is how sea stars move around. Muscles within the feet are used to retract them. Each ray of a sea star has a light sensitive organ called an eyespot, which can detect light and general direction.

Purpose: To examine the internal and external anatomy of the sea star.

Materials: Dissecting pan, dissecting tools, safety glasses, preserved sea star

Procedure:

Aboral Surface

1. Obtain a preserved starfish and rinse off any preservative with water.
2. Place the starfish in the dissecting pan with its dorsal or aboral (top) surface upward.
3. Locate the central disc in the center of the starfish. Count and record the number of arms or rays your starfish has. _____
4. Locate the small, round hard plate called the madreporite on top of the central disc. Water enters through this into the water vascular system. Color the central disc yellow, the arms orange, and madreporite green on Figure 1.
5. Feel the upper surface of the starfish for spines. These spines protect the starfish and are part of their internal skeleton. Color these blue on Figure 1.
6. Look at the tip of each arm and find the eyespot. Color this red on Figure 1.

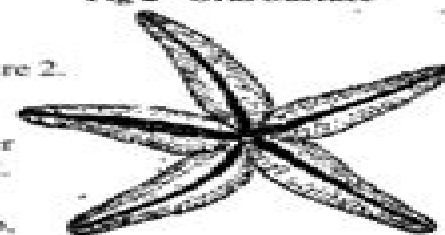
Fig 1 - Aboral Surface



Oral Surface

7. Turn the starfish over to its oral or ventral surface (underside).
8. Locate the mouth in the center of the central disc. Find the ring of oral spines surrounding the mouth. Color the mouth yellow and the oral spines red on Figure 2.
9. Find the groove that extends down the underside of each arm. This is called the ambulacral groove. Color this blue on Figure 2.
10. Feel the numerous, soft tube feet inside each groove. These are part of the water vascular system & aid in movement and feeding. Color these green on Figure 2.

Fig 2 - Oral Surface



Internal Anatomy

11. With the starfish's aboral surface up, cut off the tip of a ray. Cut along lines a, b, and c (as in Figure 3) and then remove this flap of skin.
12. Inside the arm, locate two long digestive glands called the pyloric caeca. These make enzymes to digest food in the stomach. Color these purple in Figure 4.
13. Cut a circular flap of skin from the central disc. (You will have to also cut around the madreporite in order to remove this flap.) Observe the stomach under the central disc. Color this orange on Figure 4.

Fig 3 - Cuts in Arm



Marine Biology Lab Sea Star Dissection

Julia Schneider

A red circular graphic with a gradient, appearing as a semi-circle or a partial circle, located to the right of the name bar.

Marine Biology Lab Sea Star Dissection:

The Living Ocean: Biology and Technology of the Marine Environment Student Lab-text Book ,1995 *Explorations in Basic Biology* Stanley E. Gunstream, John Stanley Babel, 1972 **Pamphlets on Biology** ,1912 **Biology** James W. Perry, Cecie Starr, David Morton, 1995 This four color lab manual contains 38 lab exercises and is designed for both introductory majors and non majors courses Most of the exercises can be completed within two hours and require minimal input from the instructor To provide flexibility instructors can vary the length of most exercises many of which are divided into several parts by deleting portions of the procedure without sacrificing the overall purpose of the experiment The Biological Bulletin Frank Rattray Lillie, Carl Richard Moore, Alfred Clarence Redfield, 1922 Vols 17 21 105 contain Annual reports of the Marine Biological Laboratory for 1907 08 1952 *Biology/science Materials* Carolina Biological Supply Company, 1991 Marine Bulletin , Scouting , Published by the Boy Scouts of America for all BSA registered adult volunteers and professionals Scouting magazine offers editorial content that is a mixture of information instruction and inspiration designed to strengthen readers abilities to better perform their leadership roles in Scouting and also to assist them as parents in strengthening families Florida Marine Education Resources Bibliography Marjorie R. Gordon, 1983

Biology ,1999 **Aquatic Physiology, Environmental Pollution, Nanotoxicology and Phytoremediation** Alaa El-Din Hamid Sayed, Francesco Fazio, Tomomi Watanabe-Asaka, Vincenzo Parrino, 2021-01-22 This Research Topic is part of the Aquatic Physiology Environmental Pollution Nanotoxicology and Phytoremediation series Aquatic Physiology Environmental Pollution Nanotoxicology and Phytoremediation Volume II Environmental pollution as a result of increasing industrialization is a major problem worldwide The toxicity of the chemicals hazards radiation and environmental stressor to the aquatic fauna was studied Although recently the excess levels of wastes discharged in water caused severe toxicity in aquatic environments and their fauna still there is some shortage in the nanotoxicology and phytoremediation studies So the aim of this Research Topic is to create some knowledge about the environmental pollution and remediation in aquatic environment in collaboration with experts in physiology biochemistry endocrinology morpho histology of aquatic fauna The relation between physiology and other research fields is strong enough as all researchers in biology field use some extent physiological parameters to evaluate the organisms health status in normal and stressful conditions In addition physiology with endocrinology and neurology can provide a contribution on the endocrine stress response of aquatic vertebrates and regulate the responses of vertebrates to stressors Whilst the physiology of most aquatic animals has been well studied not many articles provide sufficient data that helps understanding the common bases of the stress response after exposure to environmental pollutants and mechanisms of action Such approach needs to be taken both in terms of comparative responses among vertebrates but also among classes or orders within groups of vertebrates Another aspect that has not been sufficiently approached so far is physiological stress response in relation to immunity growth reproduction or behavior and

embryology of the aquatic organisms which expands the knowledge on the interactions between physiological systems to build an overall stress response *The Science Teacher* ,1998 Some issues are accompanied by a CD ROM on a selected topic *Antarctic Status Report* , *Carolina Science and Math* Carolina Biological Supply Company,2003 *Newsletter - Shoals Marine Lab* Shoals Marine Laboratory,1971 *Illinois Chemistry Teacher* ,1992 Educational Film & Video Locator of the Consortium of College and University Media Centers and R.R. Bowker Consortium of College and University Media Centers,1990 **Breaking Through** Edward Flanders Ricketts,2006 This unprecedented collection featuring previously unpublished pieces as well as others for the first time in their original form reflects the wide scope of Ricketts s scientific philosophical and literary interests during the years he lived and worked on Cannery Row in Monterey California **Bowker's Complete Video Directory, 1999** ,1999 Turtox News ,1923

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